REMARKS

By this amendment, claims 1-13 are pending, in which claims 11 and 12 are currently amended. No new matter is introduced.

The Office Action mailed March 20, 2009 objected to claims 11 and 12 because of a grammatical informality, and rejected claims 3, 11, and 12 under 35 U.S.C. § 112, second paragraph, as being incomplete, claim 1 under 35 U.S.C. § 102(b) as anticipated by *Sandahl et al.* (US 5,689,808), claim 2 as obvious under 35 U.S.C. § 103 based on *Sandahl et al.* (US 5,689,808), in view of *Counselman, III et al.* (US 2002/0126046), claim 11 as obvious under 35 U.S.C. § 103 based on *Sandahl et al.* (US 5,689,808), in view of *Mitchell Ilbery* (US 2002/0122210), claim 12 as obvious under 35 U.S.C. § 103 based on *Sandahl et al.* (US 5,689,808) and *Mitchell Ilbery* (US 2002/0122210) in view of *D'Amico et al.* (US 2007/0036243), and claim 13 as obvious under 35 U.S.C. § 103 based on *Sandahl et al.* (US 5,689,808) and *Mitchell Ilbery* (US 2002/0122210) in view of *Imai et al.* (US 4,959,872).

Applicants appreciate the indication that claims 4-10 are allowable if recast in independent form.

Claims 11 and 12 have been amended to correct grammatical informalities.

With regard to the rejection of claims 3, 11, and 12 under 35 U.S.C. § 112, second paragraph, the Office Action alleges that the claims are incomplete because of omission of "how to determine the transmission function…and what function it is" and "when the 'summated impulse response' is performed." Respectfully, these claims are complete in their present form. Claims 3, 11, and 12 recite "determining a **transmission function ($H_{SFN}(f)$) of the transmission channel** from the transmitters ($S_1,\ldots,S_i,\ldots,S_n$) to the receiver device (E)," "a unit for determining a **transmission function $H_{SFN}(f)$ of a transmission channel** of several transmitters

($S_1,\ldots,S_i,\ldots,S_n$) of the single-frequency network to the receiver device disposed within the transmission range of the single-frequency network," and "a unit for determining a **transmission function ($H_{SFN}(f)$) from pilot carriers of the received signal ($e_i(t)$)**," respectively.

As is known to skilled artisans, a transmission function of a transmission channel is a transfer function which determines what the output of the transmission channel will be based on the input to that channel, the transmission function basically being the output divided by the input. Those skilled in the art are well aware how to determine such a transmission function for a given transmission channel and Applicants assert that placing the details of such a determination into the claims would be unnecessary in a recitation of the claimed subject matter.

With regard to the claimed "summated impulse response," as is known to skilled artisans, an "impulse response" of a system is its output when presented with an impulse, or very brief, input signal. A "summated impulse response" is merely a summation of all the outputs. Thus, when claim 3, for example, recites "**calculating** a **characteristic of a complex, time-discrete, summated impulse response** ($h_{SFN1}(t)$) **at the first observation time** (t_{B1}) and a **characteristic of a complex, time-discrete, summated impulse response ($h_{SFN2}(t)$) at the second observation time** (t_{B2}) of the transmission channel respectively from the transmission function ($H_{SFN}(f)$) of the transmission channel," it is clear that there are two calculations of the summated impulse response, once at the first observation time and again at the second observation time. This should adequately address the Examiner's inquiry as to "when the 'summated impulse response' is performed."

Accordingly, Applicants assert that the rejections of claims 3, 11, and 12 under 35 U.S.C. § 112, second paragraph, have been obviated by Applicants' explanation above. If, however, the Examiner still believes these claims to be incomplete, the Examiner is respectfully invited to

suggest claim language that would satisfy the Examiner with regard to the second paragraph of 35 U.S.C. § 112 and Applicants will give any such suggested language full and serious consideration.

Thus, the Examiner is respectfully requested to withdraw the rejection of claims 3, 11, and 12 under 35 U.S.C. § 112, second paragraph.

Applicants respectfully traverse the rejection of claim 1 under 35 U.S.C. § 102(b).

A rejection for anticipation under section 102 requires that the four corners of a single prior art document describe every element of the claimed invention, either expressly or inherently, such that a person of ordinary skill in the art could practice the invention without undue experimentation. *See Atlas Powder Co. v. Ireco Inc.*, 190 F.3d 1342, 1347, 51 USPQ2d 1943, 1947 (Fed. Cir. 1999); *In re Paulsen*, 30 F.3d 1475, 1478-79, 31 USPQ2d 1671, 1673 (Fed. Cir. 1994).

Claim 1 recites, *inter alia*, "receiving, by a receiver device (E) positioned within the transmission range of the single-frequency network, a signal ($e_i(t)$) associated with a transmitted signal ($s_i(t)$) of a transmitter (S_i) **and a reference signal** ($e_0(t)$) **of a reference transmitter** (S_0)."

Even assuming, *arguendo*, Fig. 1 of *Sandahl et al.* depicts a receiver 76 positioned within the transmission range of a single-frequency network and that receiver 76 receives a signal associated with transmitted signals of transmitters 50, 52, 54, and 56, it is clear that receiver 76 does not also receive a reference signal of a reference transmitter. In fact, there is no "reference transmitter" disclosed in *Sandahl et al.* The Office Action relies on col. 3, lines 59-67, of *Sandahl et al.* to provide for this teaching. However, this portion of the reference is directed to a third aspect of the invention of *Sandahl et al.*, wherein there is a synchronized simulcast broadcast in a system having a plurality of remote transmitters. Clocked information is

provided to the plurality of remote transmitters. Adjustment commands are sent to the remote transmitters during a maintenance cycle after one of a plurality of network monitoring units detects a phase difference between a timebase at the network monitoring unit and a timebase at one of the remote transmitters. The timebase at the remote transmitters and the network monitoring units are each individually derived from the high stability clock reference at the network controller unit.

Thus, the "timebase" which the Examiner relies on as the claimed "reference" signal is not a "reference transmitter," nor does the receiver receive this "timebase" as a reference signal of a reference transmitter, as claimed. Rather, reviewing Fig. 1 of *Sandahl et al.*, for example, when NCU 26 detects a phase difference between a timebase at NMU 82 and a timebase at one of the remote transmitters 50-56, an adjustment command is sent to the remote transmitters. But instant claim 1 recites that the receiver (identified by the Examiner as element 76 in *Sandahl et al.*), receives both a signal associated with a transmitted signal of a transmitter **and a reference signal of a reference transmitter**. Receiver 76 of *Sandahl et al.* receives no reference signal of a reference transmitter. The "timebase," which the Examiner equates to a "reference," is used by NCU 26 in a manner wherein a phase difference between timebases of the remote transmitters and the NMU 82 causes an adjustment signal to be issued by the NCU 26 to the remote transmitters. The "timebase" disclosed in *Sandahl et al.* is not received by receiver 76. Moreover, there is no "reference transmitter" disclosed in *Sandahl et al.* Therefore, there can be no "**reference signal** ($e_0(t)$) **of a reference transmitter** (S_0)" received by the receiver, as recited in instant claim 1.

Accordingly, the subject matter of claim 1 is not anticipated by *Sandahl et al.* and the Examiner is respectfully requested to withdraw the rejection of claim 1 under 35 U.S.C. § 102(b).

Applicants respectfully traverse the rejection of claim 2 under 35 U.S.C. § 103.

Claim 2 depends from claim 1 and *Counselman, III et al.* does not provide for the deficiencies of *Sandahl et al.*, explained above, *Counselman, III et al.* being applied for an alleged teaching of "calculating a carrier-frequency displacement ($\Delta\omega_i$) of a carrier frequency (ω_i) of a transmitter (S_i) relative to a reference carrier frequency (ω_0) of the reference transmitter (S_0) from a phase-displacement difference ($\Delta\Delta\Theta_i(t_{B2}\text{-}t_{B1})$) caused by the carrier-frequency displacement ($\Delta\omega_i$) of this transmitter between a phase displacement ($\Delta\Theta_i(t_{B2})$) at least at one second observation time (t_{B2}) and a phase displacement ($\Delta\Theta_i(t_{B1})$) at a first observation time (t_{B1}) of a received signal ($e_i(t)$) of this transmitter (S_i) associated with the transmitted signal ($s_i(t)$) relative to a received signal ($e_0(t)$) of the reference transmitter (S_0) associated with the transmitted signal ($s_0(t)$)."

Moreover, claim 2 is separately patentable from claim 1. The Examiner relies on paragraph [0070] of *Counselman, III et al.* to teach "calculating a carrier-frequency displacement ($\Delta\omega_i$) of a carrier frequency (ω_i) of a transmitter (S_i) relative to a reference carrier frequency (ω_0) of the reference transmitter (S_0) from a phase-displacement difference ($\Delta\Delta\Theta_i(t_{B2}\text{-}t_{B1})$) caused by the carrier-frequency displacement ($\Delta\omega_i$) of this transmitter between a phase displacement ($\Delta\Theta_i(t_{B2})$) at least at one second observation time (t_{B2}) and a phase displacement ($\Delta\Theta_i(t_{B1})$) at a first observation time (t_{B1}) of a received signal ($e_i(t)$) of this transmitter (S_i) associated with the transmitted signal ($s_i(t)$) relative to a received signal ($e_0(t)$) of the reference transmitter (S_0) associated with the transmitted signal ($s_0(t)$)."

Respectfully, paragraph [0070], reciting the following:

> [0070] In summary: at reference station 40 the amplitudes, frequencies, and phases of the carrier waves received from all available transmitters 30 are measured at times governed by clock 452; and the time-tagged measurement data are transmitted via transmitter 41 and antenna 44 to vehicle 50,

The above passage clearly lacks any teaching or suggestion of "calculating a carrier-frequency displacement ($\Delta\omega_i$) of a carrier frequency (ω_i) of a transmitter (S_i) relative to a reference carrier frequency (ω_0) of the reference transmitter (S_0) from a phase-displacement difference ($\Delta\Delta\Theta_i(t_{B2}-t_{B1})$) caused by the carrier-frequency displacement ($\Delta\omega_i$) of this transmitter between a phase displacement ($\Delta\Theta_i(t_{B2})$) at least at one second observation time (t_{B2}) and a phase displacement ($\Delta\Theta_i(t_{B1})$) at a first observation time (t_{B1}) of a received signal ($e_i(t)$) of this transmitter (S_i) associated with the transmitted signal ($s_i(t)$) relative to a received signal ($e_0(t)$) of the reference transmitter (S_0) associated with the transmitted signal ($s_0(t)$)." The general disclosure of a reference station measuring, at certain clocked times, various parameters of a carrier wave would not have led the skilled artisan to perform the very specific calculation recited in claim 2 and the Examiner has not shown that it would.

In fact, the Examiner's reliance on the claimed "reference transmitter" being the clock recited in paragraph [0070] of *Counselman, III et al.* is misplaced. A clock is not a "reference transmitter." Moreover, it is the "reference transmitter" which plays an important role in claim 2 (and in claim 1), the calculation of the carrier-frequency displacement of a carrier frequency of a transmitter relative to a reference carrier frequency of this **reference transmitter** being made from a phase-displacement difference caused by the carrier-frequency displacement **of the reference transmitter** between a phase displacement at least at one second observation time and a phase displacement at a first observation time of a received signal of **the reference**

transmitter associated with the transmitted signal relative to **a received signal of the reference transmitter** associated with the transmitted signal.

Neither *Sandahl et al.* nor *Counselman, III et al.* discloses any such "reference transmitter" and, for the reasons above, *Sandahl et al.* clearly does not disclose any **received signal of the reference transmitter**. *Counselman, III et al.* is of no help in this regard as it, too, does not disclose a **received signal of the reference transmitter**.

Thus, the combination of *Sandahl et al.* and *Counselman, III et al.* does not establish a *prima facie* case of obviousness with regard to the subject matter of claim 2.

Accordingly, the Examiner is respectfully requested to withdraw the rejection of claim 2 under 35 U.S.C. § 103.

Applicants respectfully traverse the rejection of claim 11 under 35 U.S.C. § 103.

Claim 11 recites, *inter alia*, "a unit for determining a transmission function $H_{SFN}(f)$ of a transmission channel of several transmitters $(S_1,\ldots,S_i,\ldots,S_n)$ of the single-frequency network to the receiver device disposed within the transmission range of the single-frequency network." Neither *Sandahl et al.* nor *Mitchell Ilbery* discloses a determination of the claimed transmission function.

The Office Action relies on col. 3, lines 20-48, of *Sandahl et al.* for such a teaching, referring specifically to "The receiver is located to receive the simulcast radio broadcasts" (Office Action-page 7). However, the mere teaching of a receiver receiving simulcast radio broadcasts in no way is suggestive of any **determination of a transmission function** of a transmission channel of several transmitters of the single frequency network to a receiver device. *Mitchell Ilbery* is of no help in this regard, *Mitchell Ilbery* being relied on for the "knowledge"

of having a unit for performing an inverse Fourier transform and a unit for masking an impulse response.

Further, the reliance on *Mitchell Ilbery* by the Office Action is misplaced. The mere knowledge of inverse Fourier transforms (Applicants do not claim to have invented inverse Fourier transform techniques), as indicated by *Mitchell Ilbery*, is no reason why those skilled in the art would have employed such an inverse Fourier transform technique in *Sandahl et al.* or within any device for monitoring the stability of the carrier frequency of identical transmitted signals of several transmitters of a single-frequency network, a device which is much different from the device for half-toning an image as in *Mitchell Ilbery*. That is, *Sandahl et al.* and *Mitchell Ilbery* belong to nonanalogous arts and there would have been no reason for the skilled artisan to have taken anything from *Mitchell Ilbery*, e.g., an inverse Fourier transform, and apply it to the system of *Sandahl et al.*

With regard to the claim 11 feature of "a unit for masking an impulse response ($h_{SFNi}(t)$) for every transmitter (S_i) from the summated impulse response ($h_{SFN}(t)$)," the Office Action relies on paragraph [0289] of *Mitchell Ilbery*. That portion of *Mitchell Ilbery* recites "[0289] Note that with a=1, the above current and next scanline error impulse response functions correspond to the following mask functions mask curr [1] = w and mask curr [i] = 0 for i 1 mask next [i] = (1 - w) 2 w i for i <= 0 and mask next [i] = 0 for i > 0 } (56)." While this portion of the reference recites "impulse response functions" and that they "correspond" to certain mask functions, these are not impulse responses from transmitters in a single-frequency network, as claimed, and clearly does not suggest "masking an impulse response ($h_{SFNi}(t)$) for every transmitter (S_i) from the summated impulse response ($h_{SFN}(t)$)" since there are no transmitters, as claimed, nor any "summated impulse response," as claimed. The Examiner

may not merely pick and choose various unrelated terms and phrases in the prior art and patch them together in an attempt to reconstruct the instant claimed subject matter.

Accordingly, for at least, but not only, these reasons, the rejection of claim 11 under 35 U.S.C. § 103 is legally flawed and the Examiner is respectfully requested to withdraw the rejection of claim 11 under 35 U.S.C. § 103.

Applicants respectfully traverse the rejection of claim 12 under 35 U.S.C. § 103.

For the reasons above, neither *Sandahl et al.* nor *Mitchell Ilbery* discloses or suggests the determination of a transmission function or "a unit for calculating the phase-displacement difference ($\Delta\Delta\Theta_i(t_{B(j+1)}-t_{Bj})$) of the phase displacement $\Delta\Theta_i$ of a transmitter (S_i) relative to a reference transmitter (S_0) at least at two different times ($t_{Bj}-t_{B(j+1)}$) and the carrier-frequency displacement ($\Delta\omega_i$) of every transmitter relative to the carrier frequency (ω_0) of the reference transmitter (S_0)." Moreover, for the reasons above, neither of the references teaches or suggests the "impulse response," as claimed, i.e., "a unit for masking an impulse response ($h_{SFNi}(t)$) for every transmitter (S_i) from the summated impulse response ($h_{SFN}(t)$)."

The Office Action relies on *D'Amico et al.* for a teaching of the "knowledge" of determining a transmission function from the pilot signal, referring to "a device for the estimation of the transfer function of a transmission channel having both a pilot signal" of paragraph [0028] of that reference.

While *D'Amico et al.* discloses the estimation for the transfer function of a transmission channel having both a pilot signal and a data signal which contains a dedicated pilot field, this does not translate into a teaching of "a unit for determining a transmission function ($H_{SFN}(f)$) from pilot carriers **of the received signal** ($e_i(t)$)," as claimed. Estimating a transfer function of a transmission channel containing a pilot signal and a pilot field is not a teaching of determining

a transmission function **from** pilot carriers of a **received signal**. Moreover, the Office Action does not explain what possible reason the skilled artisan would have had for determining a transmission function of a transmission channel in *Sandahl et al.* by using pilot carriers of a received signal. Nothing in any one of *Sandahl et al.*, *Mitchell Ilbery* and/or *D'Amico et al.* provides for such a reason. As such, no *prima facie* case of obviousness has been established with regard to the subject matter of claim 12.

Accordingly, for at least, but not only, these reasons, the rejection of claim 12 under 35 U.S.C. § 103 is legally flawed and the Examiner is respectfully requested to withdraw the rejection of claim 11 under 35 U.S.C. § 103.

Applicants respectfully traverse the rejection of claim 13 under 35 U.S.C. § 103.

Claim 13 is allowable for the reasons given above regarding its independent claim 11, since the additional reference to *Imai et al.*, applied for a teaching of the "knowledge" of displaying to a user via a display the calculated frequency displacement, does not provide for the deficiencies of the primary references.

Moreover, claim 13 recites "the unit for presenting the calculated carrier-frequency displacement ($\Delta\omega_i$) of every transmitter (S_i) relative to the carrier frequency (ω_0) of the reference transmitter (S_0) comprises a tabular and/or graphic display device." The Office Action indicates col. 15, lines 53-62, of *Imai et al.* as teaching this feature. The cited portion of *Imai et al.* refers to a third key being useful for recovering the center frequency and for a provisional operation to another frequency offsetting operation by a first or second key. It also recites that the third key for reset operation can be removed if any display device for indicating the offset frequency is provided. It does not disclose or suggest "the unit for presenting the calculated carrier-

frequency displacement ($\Delta\omega_i$) of every transmitter (S_i) relative to the carrier frequency (ω_0) of the reference transmitter (S_0) comprises a tabular and/or graphic display device."

Accordingly, for at least, but not only, these reasons, the rejection of claim 13 under 35 U.S.C. § 103 is legally flawed and the Examiner is respectfully requested to withdraw the rejection of claim 11 under 35 U.S.C. § 103.

The indication by the Examiner of the patentability of the subject matter of claims 4-10 is gratefully acknowledged.

Therefore, the present application, as amended, overcomes the objections and rejections of record and is in condition for allowance. Favorable consideration is respectfully requested. If any unresolved issues remain, it is respectfully requested that the Examiner telephone the undersigned attorney at (703) 519-9952 so that such issues may be resolved as expeditiously as possible.

To the extent necessary, a petition for an extension of time under 37 C.F.R. §1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 504213 and please credit any excess fees to such deposit account.

Respectfully Submitted,

DITTHAVONG MORI & STEINER, P.C.

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Date

/Phouphanomketh Ditthavong/
Phouphanomketh Ditthavong
Attorney/Agent for Applicant(s)
Reg. No. 44658

Errol A. Krass
Attorney for Applicant(s)
Reg. No. 60090

918 Prince Street
Alexandria, VA 22314
Tel. (703) 519-9952
Fax (703) 519-9958